

Application No. 10/694,960

AMENDMENT AND RESPONSE dated October 26, 2007

Reply to Office Action of April 4, 2007 and Notice of Panel Decision  
from Pre-Appeal Brief Review of August 6, 2007

### REMARKS

After entry of the present amendment, claims 1-7 and 27-42 are pending in the application. Claims 1-7 and 27-32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over US 5,750,177 ("Yee"). Applicants respectfully request reconsideration and allowance in view of the discussion presented herein.

**A. No Prima Facie Case Of Obviousness Has Been Established Over Claims 1-7 And 27-32 Using Yee Because Yee Fails To Disclose Or Provide A Reason To Derive The Claimed Ratio Of Casein To Whey In A Cheese Providing the Claimed Melting Points**

Independent claims 1 and 27 define a process cheese comprising casein and whey proteins with a ratio of casein to whey from about 50:50 to about 75:25. That is, the claims define a process cheese having a casein to whey protein ratio of about 1:1 to about 3:1, or about 50 to about 25 percent whey (relative). As acknowledged in the Office Action dated April 4, 2007, Yee fails to disclose this claimed ratio of casein to whey. (April 4, 2007 Office Action, page 2.) Yee only discloses a ratio of casein to whey between 16:1 and 4:1<sup>1</sup> or 5.9 to 20 percent whey (relative), which is a lower amount of whey resulting in a casein to whey ratio above that claimed. However, in light of clear disclosures to the contrary in Yee, the Office Action has provided no specific, objective reason to modify Yee as proposed to disclose or suggest a process cheese having the claimed casein to whey ratios that also exhibits the claimed melting points. Instead, the

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<sup>1</sup> Yee discloses whey to casein ratios between 1:16 to 1:4. For consistency with the claims, which recite a casein to whey ratio, the ratios of Yee have been reversed to 16:1 to 4:1.

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Office Action relies on unsupported and conclusory statements.<sup>2</sup> Indeed, as described below, the Office Action ignores and misconstrues the clear teaching of Yee to arrive at these rejections.

**1. Yee Is Technically Limited To Casein To Whey Ratios  
Between 16:1 And 4:1**

To being with, the process of Yee is technically incapable of producing a cheese with higher levels of whey protein or a lower casein to whey ratio. The Office Action ignores Yee's technical deficiencies by merely suggesting "Yee et al teach a modification of the protein ratios."<sup>3</sup> However, just because Yee discloses a specific range of casein to whey ratios does not mean this references also discloses ratios outside of this range. In particular, Yee does not disclose any procedure to obtain a lower casein to whey ratio (*i.e.*, higher amounts of whey) in cheese beyond the casein to whey ratio in milk. The attached graphical representation of Figure 1 illustrates the various casein to whey ratios of conventional cheese (*i.e.*, 150:1 to 40:1), the cheese of Yee (*i.e.*, 16:1 to 4:1), a typical cow's milk (*i.e.*, 4:1), and the inventive cheese (*i.e.*, about 1:1 to about 3:1). This

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<sup>2</sup> As stated in *KSR Int'l Co. v. Teleflex Inc.*, 550 US \_\_\_, 82 USPQ2d at 1396 "rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."

<sup>3</sup> This is similar to arguing that since NASA has produced space vehicles capable of traveling from 0 (before blast off) up to about 44,000 mph (*see, for example*, "Md. Mission adds to data on Jupiter, New Horizons spacecraft takes a look at planet, moons on way to Pluto," BALTIMORE SUN, October 10, 2007), NASA also generally teaches that the speed of a space craft can be varied. And, therefore, a claim directed to a space craft (fully enabled) traveling at 100,000 mph, or 250,000 mph, or even at 0.5 times the speed of light or higher would be obvious since it is known from the prior art that the speed of a space craft can be varied. In both this example and in the inventive case, "obvious to try" does not make such invention obvious since the art would not know how to make the invention until the invention was provided by the inventors. As discussed herein, Yee does not provide any method of producing a cheese with a casein to whey ratio lower than 4:1. (April 4, 2007 Office Action, page 2.)

diagram has been modified from the previous diagram presented in an earlier response by the addition of an axis based on the relative amount of whey as compared to the total whey and casein. This additional axis is included since it may be easier to visualize percentages as compared to ratios.

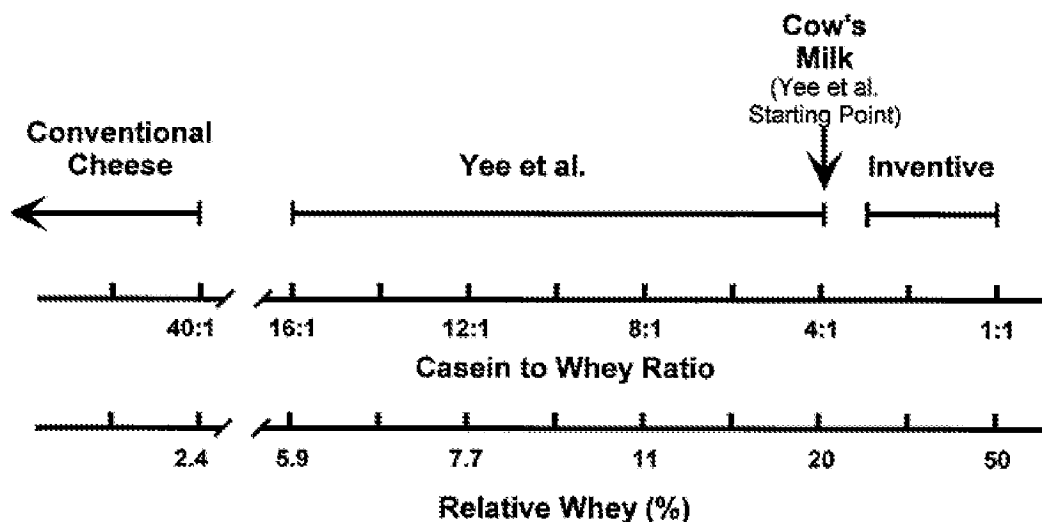


FIGURE 1

In addition, a further graphical representation plotting the casein to whey ratios and relative whey amounts against the melting points of both the claimed cheeses and the cheese of Yee is illustrated in Figure 2. As is clearly shown in the chart of Figure 2 and more fully discussed below, even if one assumes that Yee suggests cheeses having the casein to whey ratio as claimed (which it does not), the data of Yee clearly indicates and teaches that such hypothetical cheeses with increased levels of whey would be

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expected to have increased melting points of around 180°F.<sup>4</sup> Indeed, as clearly shown in Figure 2, one of ordinary skill in the art, based on Yee, would expect cheese having the casein/whey ratio of the present claims to be much higher. The claimed cheeses, on the other hand, clearly provide a much lower melting point (*i.e.*, about 105 to about 150°F) even with levels of whey outside of that disclosed by Yee. Applicants respectfully request that the Examiner carefully consider the diagrams of Figures 1 and 2 and the arguments based on these diagrams that follow.

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<sup>4</sup> Yee specifically teaches that higher levels of whey provide higher melting points: "One of the well known problems with cheese made by ultrafiltration, and hence containing high levels of whey proteins, is the poor melt properties of the cheese . . . the difference becoming progressively larger as the degree of concentration is increased." (Col. 3, lines 45-52.)

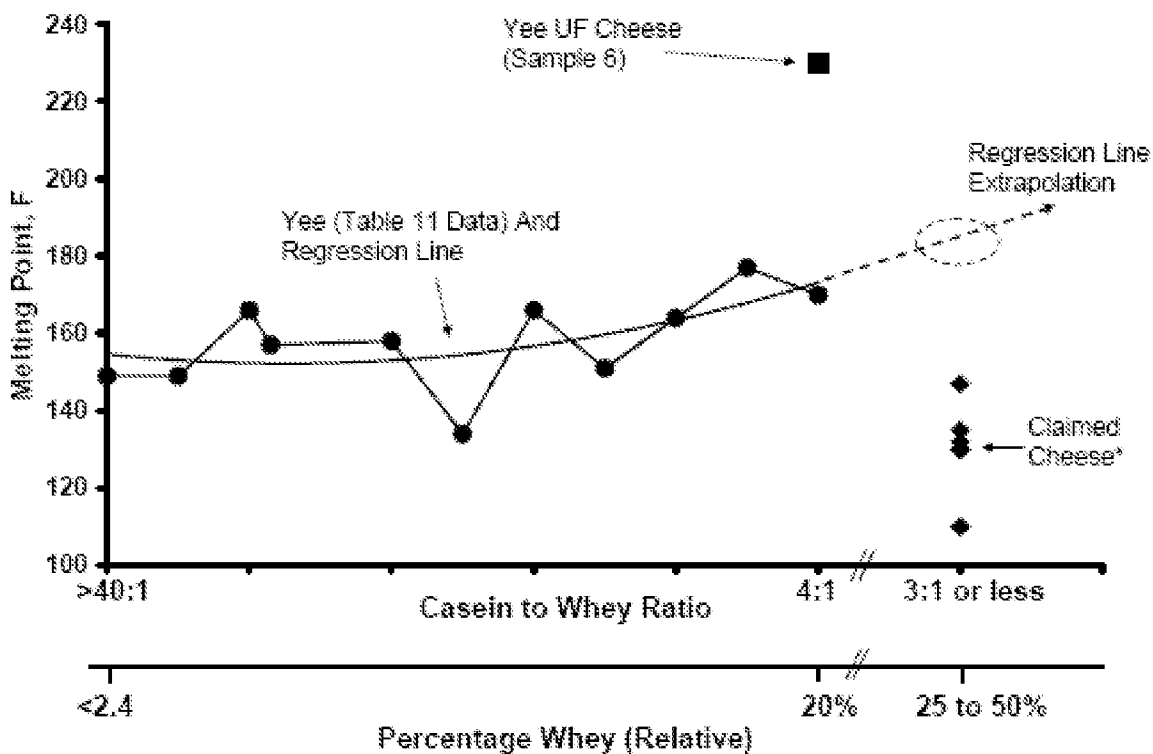


FIGURE 2

\*The present application characterizes the casein/whey ratio of the claimed cheeses to be 3:1 or less.

As suggested by Figure 1 above, Yee is incapable of producing ratios of casein to whey in the inventive range of the graph. The process of Yee utilizes ultrafiltration to retain whey and casein as naturally occurring in milk (*i.e.*, cow's milk in the diagram). As specified by Yee, "[m]ilk has a whey proteins [sic] to casein ratio of about 1:4." (*i.e.*, a casein to whey ratio of 4:1) (Col. 1, lines 14-15.) As is known and specifically acknowledged in Yee, milk subjected to ultrafiltration will concentrate both whey and casein; as a result, the ratio of whey to casein does not change as a result of

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ultrafiltration. As Yee explains, “[t]he selective concentration of milk results in the formation of a retentate that contains both casein and whey proteins, in the same ratio as in the milk.” (Col. 1, lines 32-35, emphasis added.)

To vary the casein to whey ratio from 4:1 to 16:1, Yee simply blends a cheese prepared by ultrafiltration (having a casein to whey ratio of 4:1 (or 20% whey (relative)) with a conventional cheese (having a casein to whey ratio of about 40:1 or more (or about 2.4% whey or less (relative))). See examples 8-13 in Yee. For example, as shown in Table 11, the amount of conventional cheese to the ultrafiltered cheese can range from 10% (*i.e.*, 10% of conventional cheese having a casein/whey ratio of 40:1 and 90% of ultrafiltered cheese having a casein/whey ratio of 4:1) to 100% (*i.e.*, 100% ultrafiltered cheese having a casein to whey ratio of 4:1 with no added conventional cheese). At intermediate ratios of conventional to ultrafiltered cheese, the casein to whey ratio will be intermediate to the extreme of 40:1 and 4:1. In other words, since Yee produces cheese with varying casein to whey ratios by blending conventional cheese (40:1) with ultrafiltered cheese (4:1), Yee can only produce a cheese with a casein to whey ratio of between 40:1 and 4:1. It is impossible for Yee to produce any cheese outside of these ratios because Yee does not provide any method to obtain cheese having a casein to whey ratio greater than 4:1 and, thus, cannot provide the cheese provided by the present claims.

Because Yee uses ultrafiltration to retain whey and casein from milk, the ratio of casein to whey in the resultant cheese of Yee can never be lower than the natural ratio of milk (*i.e.*, 4:1). The Office Action fails to even address these technical deficiencies of Yee. The Office Action simply attempts to dismiss this and other arguments by merely stating the conclusion “Yee et al clearly teach the adjustment of the whey to casein

ratio" (Office Action, page 3). Should this rejection be maintained, Applicants respectfully request that the Office Action specifically point out how one of ordinary skill in the art using the disclosure of Yee could make a cheese having the claimed casein to whey ratio. And, as stated further below, reliance on the argument that modification of whey is "well known" is insufficient under the guidelines provided in MPEP Section 2143 and under the recent decision in *KSR Int'l Co. v. Teleflex, Inc.*

## **2. Yee Teaches Cheeses With Higher Levels Of Whey Are Unacceptable**

In addition to Yee's technical limitations, Yee also specifically discloses that increasing the amount of whey in cheese (*i.e.*, lowering the casein to whey ratio) results in problems (unacceptable high melting points) that become increasing more problematic as the level of whey increases. In particular, Yee states:

One of the well know problems with cheese made by ultrafiltration, and hence containing high levels of whey proteins, is the poor melt properties of the cheese. On page 78, the Qvist document states, "It is an unfortunate fact that cheese made from UF-concentrated milk has impaired stretching and melting properties compared to traditional cheese . . . the difference becoming progressively larger as the degree of concentration is increased."

(Col. 3, lines 45-52, emphasis added.) Yee specifically teaches that cheese with increased levels of whey (*i.e.*, a lower casein to whey ratio) has unacceptable properties. As a result, Yee also teaches away from a cheese with higher levels of whey outside of its specifically disclosed range. The Office Action also fails to address Yee's specific acknowledgement that higher levels of whey in cheese result in unacceptable properties. As shown by the regression line and extrapolation thereof in Figure 2,

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based on Yee's data, one of ordinary skill in the art would expect cheese having the claimed casein to whey ratio to have unacceptable melt properties.

### **3. No Reason Has Been Provided To Modify Yee As Proposed**

As noted in Subsections 1 and 2 above, Yee only discloses a ratio of casein to whey as low as 4:1, specifically discloses a process technically incapable of producing a lower ratio (*i.e.*, amounts of whey greater than 20%), and expressly recognizes problems with increasing the whey content in cheese. In light of these deficiencies, the Office Action has provided no objective basis that it would have been obvious or reasonable from the disclosure of Yee to increase the levels of whey beyond what is specifically disclosed by this reference (*i.e.*, a casein to whey ratio only between 16:1 and 4:1). The Office Action has ignored the weight of evidence against modifying Yee and the specific teaching of Yee by merely stating the "manipulation of the casein to whey ratio is well-known in the art" (April 4, 2007 Office Action, page 3). Such unsupported statement is contrary to Yee, which, as discussed above, does not provide any method of preparing a cheese having a casein to whey ratio lower than 4:1, much less one having good melt properties within the claimed range.

The Manual of Patent Examining Procedure (MPEP) in Section 2143.01 indicates that the mere fact that references can be modified does not render the resultant modification obvious unless the prior art also suggests the desirability of the modification. However, in suggesting the desirability of the modification, Section 2143.01 also states it is insufficient (as the Office Action has done in this case) to merely suggest the modification is well within the ordinary skill of the art, and Section 2413.02 further



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requires a reasonable expectation of success in the modification. Indeed, *KSR Int'l Co. v. Teleflex, Inc.*, No. 550 U.S. \_\_\_, 04-1350, \*14 (April 30, 2007) requires the Office Action to provide an explicit reason and method to modify the reference.<sup>5</sup>

In this case, the objective reason to modify Yee is clearly lacking because Yee fails to suggest the desirability of the proposed modification (*i.e.* a process cheese having casein to whey ratios outside the specific disclosure of Yee), fails to provide a method of obtaining such a cheese (due to Yee's technical shortcomings), and, perhaps even more importantly, specifically discloses that increased levels of whey result in cheese having unacceptable melting properties. The Office Action's suggestion that "the manipulation of the casein to whey ratio is well-known in the art" (April 4, 2007 Office Action, page 3) is clearly insufficient to provide an explicit, objective reason to modify Yee as proposed in light of Yee's specific disclosures teaching away from the proposed modification. With Yee stating "[o]ne of the well know problems with cheese made by ultrafiltration, and hence containing high levels of whey proteins, is the poor melt properties of the cheese . . . . the difference becoming progressively larger as the degree of concentration is increased," there is clearly no reasonable expectation of success to modify the casein to whey ratios outside those specifically disclosed in Yee. (*See* Col. 3, lines 45-52.)

Nevertheless, even if one assumes Yee suggests to one of ordinary skill that a process cheese can include increased levels of whey (which it does not), Figure 2 above illustrates that such a hypothetical Yee cheese would still not exhibit the claimed melting points. Based on the data in Yee, one of ordinary skill would expect a processed cheese with increased levels of whey to have an increased melting point

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<sup>5</sup> The reader is again referred to the space craft analogy in footnote 3.

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around 180°F or greater. The claimed cheese, on the other hand, exhibits just the opposite – decreased melting points around 105°F to about 150°F.

#### **4. Office Action Has Failed To Consider Unexpected Results**

The Office Action suggested the Applicants need to provide evidence of unexpected results. However, because the Office Action has not provided a *prima facie* case of obviousness using the Yee reference as discussed above, the Applicants are not required to provide such evidence.

Nevertheless, as Applicants have pointed out and as clearly shown in Figure 2 above, the present invention provides unexpected results. Indeed, as illustrated in Figure 2 above, Applicants improvement in melting point with increased levels of whey is clearly unexpected in view of Yee's teaching that high levels of whey results in higher melting properties which tend to get worse as the amount of whey is increased. (Col. 3, lines 45-52.) As discussed previously, based on the data in Yee, one of ordinary skill in the art would expect higher melting points with increased levels of whey. Applicants' cheese, on the other hand, exhibits significantly decreased melting points with increased levels of whey. These unexpected and surprising results relative to Yee are clearly shown in Figure 2 above.

One of ordinary skill in the art looking at the data in Yee (especially when presented graphical as in Figure 2) would expect melting points significantly higher than those provided by the present claims. Indeed, one would expect the melting points to follow the dotted portion of the regression line based on Yee's data in Figure 2, and thus be around 180°F.

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**B. No *Prima Facie* Case Of Obviousness Has Been Established With Claims 33-37 Over Yee Because Yee Fails To Disclose Or Provide A Reason To Derive The Claimed Ratio Of Casein To Whey And Fails To Disclose A Homogenized Emulsion**

Independent claim 33 is similar to original claim 1 by requiring the same casein to whey ratio and melting points, but further defines the casein and whey protein as a homogenized emulsion. As a result, independent claim 33 is patentable over Yee for the same reasons as discussed in Section A above, which is incorporated herein by reference. In addition to not disclosing the claimed ratio and melting points, Yee specifically teaches away from a process cheese that includes casein and whey protein in the form of a homogenized emulsion.

To the contrary, Yee discloses a cheese that must be subject to low shear mixing and specifically states that detrimental results are obtained when Yee's cheeses are subject to high shear mixing. For example, it is stated that the results of Example 2 in Yee "clearly demonstrate the detrimental impact of high shear . . . on melt performance." (Col. 14, lines 44-46.) As a result, Yee does not disclose its casein and whey in the form of a homogenized emulsion. Yee teaches away from such form of the dairy proteins.

The Office Action completely ignored the limitations in claims 33 to 37 by merely stating "the new claims are not seen to influence the conclusion of unpatentability previously set forth." (Office Action, April 4, 2007, page 2.) However, the Office Action has provided no explicit, objective reason as required by MPEP 2143 and *KSR* to modify Yee to derive a processed cheese having homogenized proteins (and the required ratio

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of casein to whey) as defined in independent claim 33 against the backdrop of specific teachings against using high-shear mixing as disclosed in Yee.<sup>6</sup>

**C. No *Prima Facie* Case Of Obviousness Has Been Established With Claims 38-42 over Yee Because Yee Fails To Disclose Or Provide A Reason To Derive The Claimed Ratio Of Casein To Whey And Fails to Disclose The Use Of Modified Dairy Proteins**

Independent claim 38 is also similar to original claim 1 by requiring the same casein to whey ratio and melting points, but further defines at least one of the casein or the whey protein as being a modified dairy protein. As a result, independent claim 38 is patentable over Yee for the same reasons as discussed in Section A above, which is incorporated herein by reference. In addition to not disclosing the claimed ratio and melting points, however, there is also no disclosure in Yee of its protein being a modified dairy protein or a disclosure of the specific forms of the modified proteins in dependent claims 39-42. Yee only discloses cheese produced from ultra-filtration of dairy milk and does not disclose, suggest, or provide a reason for one of ordinary skill to use a modified dairy protein.

The Office Action also completely ignored the limitations in claims 38 to 42 by merely stating “the new claims are not seen to influence the conclusion of unpatentability previously set forth.” (Office Action, April 4, 2007, page 2.) As indicated in Footnote 6, this is merely stating a conclusion – the Office Action has provided no explicit, objective reason as required by MPEP 2143 and *KSR* to modify Yee to derive a processed cheese using modified dairy proteins (and the required ratio of

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<sup>6</sup> Indeed, the Examiner does not provide any reasoning why the limitations are considered obvious. (As throughout the Office Action, the Examiner simply provides a conclusion.)

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casein to whey) as defined in independent claim 38 against Yee's failure to disclose or even suggest the desirability of using modified protein in a processed cheese.

**D. Conclusion**

Reconsideration and allowance of claims 1-7 and 27-42 are respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required with respect to this communication, or credit any overpayment, to Deposit Account No. 06-1135.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: October 26, 2007

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